

24 Apr 1991

OS0HR-B
OSCILLOSCOPE

1. GENERAL. This procurement requires a portable, general purpose oscilloscope.

2. CLASSIFICATION. Type II, Class 5, Style F, and Color R in accordance with MIL-T-28800 for shipboard applications.

3. OPERATIONAL REQUIREMENTS. The equipment shall be capable of operation within the minimum accuracies, limits, and specifications detailed below.

3.1 Vertical amplifiers. The requirements specified below apply to two identical vertical channels. The capability of inverting the signal polarity of at least one channel shall be provided by manipulation of a front-panel control.

3.1.1 Bandwidth. DC to 100 MHz. AC low frequency roll-off: 10 Hz or less.

3.1.1.1 Bandwidth limiting. A control shall be provided to limit high frequency interference.

3.1.2 Deflection factor. Range: 5 mV/div to 5 V/div continuously variable between calibrated steps. An uncalibrated condition indicator is required.

3.1.2.1 DC accuracy. ± 0.2 divisions.

3.1.3 Overload protection. At any vertical range setting, ac or dc coupled: $\pm 250V$ (dc + peak ac) to 2 kHz, $\pm 10V$ (dc + peak ac) to 1 MHz, and $\pm 5V$ (dc + peak ac) to 100 MHz.

3.1.4 Common mode rejection ratio. 20 dB at 50 MHz.

3.1.5 Display modes. Channel A, channel B, channels A and B simultaneously, and add.

3.1.6 X-Y operation. Bandwidth: 2 MHz. Phase difference: 3° maximum at 100 kHz.

3.2 Horizontal deflection.

3.2.1 Sweep modes. Normal, delayed, and intensified. (Intensified is not required of digitizing oscilloscopes.)

3.2.2 Sweep trigger modes. Normal, automatic, and single.

3.2.3 Main time base. Range: 0.05 μs /div to 0.5 s/div continuously variable between calibrated steps. An uncalibrated condition indicator is required. Accuracy: $\pm 3\%$ of setting.

3.2.4 Delayed time base. Range: 0.05 μs /div to 20 ms/div continuously variable between calibrated steps. An uncalibrated condition indicator is required. Accuracy: $\pm 3\%$ of setting.

3.2.5 Intensification. A control shall be provided to intensify that part of the sweep controlled by the main time base that is to expand to full screen display in the delayed time base mode. (This function is not required of digitizing oscilloscopes.)

3.2.6 Horizontal triggering.

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3.2.6.1 Trigger source. Channel A, channel B, composite, or external.

3.2.6.2 Trigger sensitivity.

a. Internal (except chop mode): 0.35 division peak-to-peak from dc to 25 MHz decreasing to 1 division peak-to-peak at 100 MHz.

b. External: 50 mV peak-to-peak from dc to 25 MHz decreasing to 150 mV peak-to-peak at 100 MHz.

3.2.6.3 External trigger maximum input. $\pm 250V$ (dc + peak ac) at 1 kHz or less.

3.2.6.4 Trigger coupling. DC, ac, low frequency reject, and high frequency reject.

3.2.7 Sweep expansion. A X10 sweep expansion (horizontal magnifier) control for the main and delayed time bases shall be provided. Accuracy: $\pm 5\%$ of the time base setting.

3.2.8 Horizontal position. A horizontal position control shall be provided to move the left end of the trace to the right past the center graticule and the right end of the trace to the left past the center graticule. This specification shall apply in both the X1 and X10 horizontal magnifier position. (This function is not required of digitizing oscilloscopes.)

3.3 Calibrator. A square wave calibrator signal shall be provided through a front-panel connector that is compatible with at least one type of supplied probe tip. The calibrator voltage shall be regulated to within $\pm 1\%$ when loaded by 1 megohm paralleled by 25 pF or less. The calibrator signal shall have a rise time not to exceed 1 μs and shall have protection from damage when grounded.

3.4 CRT display. A CRT display shall be provided that has a minimum useful scan area of ten divisions wide by eight divisions high. A division shall equal at least 0.8 cm.

3.4.1 Graticule. An internal graticule shall be provided. The cardinal axes shall be ruled in 0.2 major division increments.

3.4.2 CRT controls and adjustments. Focus, intensity, beam finder, astigmatism, and trace rotation for analog oscilloscopes. Intensity only for digitizing oscilloscopes.

3.4.3 Z-axis input. An input shall be provided to permit intensity modulation of the display within a range of dc to at least 10 MHz.

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-T-28800 nominal power source requirements are invoked. Operation at 400 Hz is not required. Maximum power consumption: 250W.

4.2 Weight. 20 kg (44 lb) maximum.

4.3 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.4 Accessories. Two 10:1 voltage divider probes, two 1:1 voltage probes, and a probe tip kit for each probe.

4.4.1 Accessory pouch. An accessory pouch shall be provided for storage of all supplied accessories.